

WE CLAIM:

- 1 1. An imaging system, comprising:
2 an imaging optics for forming an image of an object, said imaging optics
3 having a
4 focal length that varies with wavelength of light that illuminates the object;
5 an image receiving unit for receiving an image of said object formed by said
6 imaging optics; and
7 a light source for sequentially illuminating said object with light of different
8 ones of a plurality of wavelengths for providing a plurality of images of said object
9 received by said image receiving unit.

- 1 2. The imaging system according to Claim 1, wherein said imaging optics
2 has a focal length that varies inversely with a wavelength of light that illuminates the
3 object

- 1 3. The imaging system according to Claim 2, wherein said imaging optics
2 comprises a combined refractive/diffractive lens.

- 1 4. The imaging system according to Claim 1, wherein said image
2 receiving unit comprises an array of photosensors.

- 1 5. The imaging system according to Claim 4, wherein said array of
2 photosensors comprises a CMOS detector array.

1 6. The imaging system according to Claim 1, wherein said light source
2 comprises a plurality of separate light sources, each of said plurality of separate light
3 sources illuminating said object with light of a different wavelength.

1 7. The imaging system according to Claim 6, wherein said plurality
2 of separate light sources comprises a plurality of light emitting diodes.

1 8. The imaging system according to Claim 6, wherein said plurality
2 of separate light sources comprises from about three to about five light sources.

1 9. The imaging system according to Claim 1, and further including a
2 processor for selecting a desired image among said plurality of received images.

1 10. The imaging system according to Claim 9, wherein said desired image
2 comprises a best-focused image among said plurality of received images.

1 11. The imaging system according to Claim 2, wherein an object
2 distance between said imaging lens and said object varies from between about 5
3 inches to about 20 inches, and wherein said plurality of wavelengths comprise a
4 plurality of wavelengths between about 450nm and about 980nm.

1 12. The imaging system according to Claim 11, wherein said object
2 comprises an iris of an eye.

1 13. The imaging system according to Claim 11, wherein said object
2 comprises a fingerprint.

1 14. The imaging system according to Claim 1, wherein said imaging
2 system comprises a digital still camera.

1 15 A method for providing a desired image of an object, comprising:
2 providing an imaging system that includes a light source for sequentially
3 illuminating an object to be imaged with light of different ones of a plurality of
4 wavelengths, and an imaging lens having a focal length that varies with a wavelength
5 of the light that illuminates the object;
6 operating said light source to sequentially illuminate said object with said light
7 of different ones of a plurality of wavelengths to form a plurality of images of said
8 object; and
9 selecting a desired image among said plurality of formed images.

1 16. The method according to Claim 15, wherein said selecting comprises
2 selecting a best-focused image among said plurality of formed images.

1 17. The method according to Claim 15, wherein said operating said
2 light source comprises sequentially illuminating said object with light of a plurality of
3 separate light sources, each of said plurality of separate light sources illuminating said
4 object with light of a different wavelength.

1 18. The method according to Claim 15, wherein said imaging lens has a
2 focal length that varies inversely with a wavelength of the light that illuminates the
3 object.

1 19. The method according to Claim 18, wherein an object distance
2 between said imaging lens and said object varies from between about 5 inches to
3 about 20 inches, and wherein said plurality of wavelengths comprise a plurality of
4 wavelengths between about 450nm and about 980nm.

1 20. The method according to Claim 15, wherein said forming comprises
2 forming said plurality of images on a photosensor array.

1 21. The method according to Claim 15, wherein said operating said
2 light source comprises operating said light source for sequentially illuminating said
3 object at a rate of 60 images per second.

1 22. The method according to Claim 15, wherein said imaging system
2 comprises a digital still camera.